

# Nuclear Power Systems for the 90s and Beyond

A reorganization of the Energy Programs 6000 vice-presidency, specifically the recently announced formation of a new directorate, is a major step in positioning Sandia to contribute to the nation's energy future.

The new directorate, Exploratory Nuclear Power Development 6500, will focus its undivided attention on contributing to the "second nuclear power era" foreseen for the 1990s and into the next century. That era is likely to be one of improved commercial LWR (light water reactor) technologies, of exploring alternative advanced commercial nuclear power systems (likely based on a non-water primary coolant technology), and of space-based and specialized terrestrial nuclear power systems for military and civilian (such as NASA) applications.

Heading the new directorate will be Bill Snyder, who has led the Nuclear Fuel Cycle 6400 directorate since 1975. That organization, to be renamed Nuclear Regulatory Research 6400 and to be headed by Dave McCloskey (currently 1520; see "McCloskey Named" story), will be split: Essentially, the NRC (Nuclear Regulatory Commission) programs and the new Space Assets Survivability Division 6448 will be part of 6400; "second nuclear power era" activities will become part of 6500.

"Creation of the new organization shows that Sandia is seriously committed to its energy mission," says Energy VP Dan Hartley (6000). "This is exactly the kind of action that positions us to move into the 90s as the nation's energy problems become more acute.

"Of course, creating a new organization is merely the first, and by far the easiest, step toward revitalizing nuclear power in this country," Dan continues. "We're really fortunate to have someone of Bill's stature and reputation to lead this effort."

"The challenge of the new directorate is exciting both for me and for Sandia," says Bill. "On the personal level, I've got about four years until retire-

*(Continued on Page Six)*



BILL SNYDER, long-time nuclear power expert at Sandia, heads new directorate.



## **Family 'Tough Guy'**

### **Sandia-Developed Monitor Used in Stockpile Sampling Program**

This country's nuclear weapon stockpile sampling program is serious business. It involves systematic inspection of components in nuclear weapons to ensure their safety, reliability, and readiness. A Sandia-developed monitor now used in the sampling program characterizes with utmost precision the pressure waves generated by detonators used in weapons.

Previously, stockpile sampling on SNLA systems involved obtaining "fact of" detonator function — a measurement that verified only that the detonator had been fired, but that did not provide timing information. However, newer — and more sophisticated — weapon systems require more precise kinds of measurement, and that's where the Sandia monitor comes into the picture.

A key element in the monitor is an extremely tiny lithium niobate crystal (0.125 in. in diameter — slightly larger than the lead in your #2 pencil — and 0.0165 in. thick — a bit thicker than Sandia-issue yellow tape). Lithium niobate is a synthetically produced piezoelectric crystal with the ability to convert a mechanical force — in this case, the pressure wave from an exploding detonator — into an electrical signal.

"Lithium niobate is a 'tough guy' in the ferroelectric materials family," says Dick Precit (7545), who had responsibility for design, development, and ultimate qualification of the monitor. "It can sustain a current long enough to give us the data we're after, even under extremely high pressures. And we're looking at a tremendous blast of pressure when one of these detonators is activated — typically 300 to

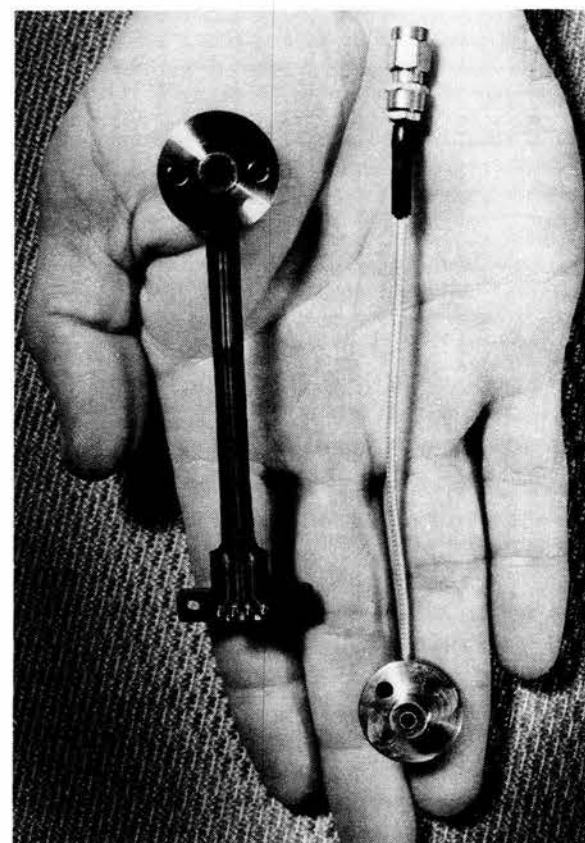
400 kilobars [nearly 5 million psi] on the crystal's surface."

"What's really interesting," Dick continues, "is that such a very small device [the crystal] has the capability of generating such a large current — up to 16 amps. And because of its ability to generate that much current — albeit in a very short time frame — the device has a high signal-to-noise ratio. We get precise data, even though it must function in an electrically noisy environment. During tests, the detonators generate pressure waves traveling at 12,500 feet per second, so the monitor takes a pretty good zap. In fact, it's literally destroyed, but not before we get the signal measurement we need."

#### **Delivers Precise Data**

How precise are the data? The monitor — called a lithium niobate stress transducer — detects the arrival of a pressure wave from an exploding detonator instantaneously (times substantially less than a microsecond), according to Dick. The monitor is able to respond to submicrosecond timing, he says, because of its ability to produce an extremely fast rise time current pulse. "We can achieve precise timing measurements — even if we're timing pressure waves produced by several detonators — because of the fast-rise-time feature," says Dick. Another typical measurement, he explains, could be determining the time of arrival — at several locations — of a single detonator's pressure wave.

*(Continued on Page Seven)*



A NICKEL-SIZED stainless steel platform supports the business end of a Sandia-developed detonator monitor. A tiny lithium niobate crystal — visible as small circle in original monitor on right — at the end of half-inch-long cylinder instantaneously detects the arrival of a pressure wave from an exploding detonator and converts the force to an electrical signal. A new version of the device (left), now under development, has a self-check feature to ensure the monitor's functional integrity just before it's used for pressure wave measurements.



# Antojitos

**Frigidity and Its Causes:** Arctic winds, primarily. But now that I have your attention, and now that we've all survived the near-blizzard of '87 (digression 1: yes, we had a few broken bones caused by slipping on ice, but no fatalities; digression 2: real blizzards have winds of more than 35 mph and heavy snow, says the Weather Service), it's time to reflect upon those people who were out there to keep Sandia running -- more or less (the latter last Friday afternoon).

One such group inhabits the Mail Room. Those folks braved the cold, winds, snow, and ice several days in a row to get the mail delivered in spite of the glorified golf carts (without heaters) they use within Area I and in spite of the snow clinging to the baskets they wheel into each building.

Another group is Security. In addition to the exposure to the elements involved in badge-checking at the gates and in patrolling the entire Sandia complex (and fighting frozen locks), it's the Security people who provide battery jumps for drivers stranded after they left their car lights on, and, more important, ambulance service (and, if necessary, First Aid) for the rest of us. And it's Security that keeps in touch with the Weather Service and the Base, and coordinates early departures in snow storms; Capt. Bill Wolf (3434) was the honcho here.

And the transportation, custodial, and plant maintenance and operations people had even greater extra challenges: shoveling and salting entryways, clearing sidewalks and streets and parking lots, hauling off the snow (see the photo below), fixing (and cleaning up after) the leaks from pipes split by freezing, delivering gas to government vehicles operated by Sandians who were too cold to even consider standing outside to fill up gas tanks (one guy had to be saved twice!), and coming in over the weekend to clean up after the snow on Saturday. "Had a wrecker call every 18-1/2 minutes," says Bob Barton (3423). The effects of the storm were, in fact, severe enough that Chuck Wells (7818) and his heavy-equipment operators from the remote areas had to be called into Area I to help clear the streets.

The rest of us, once we were safe at home? Well, I don't know about you, but I did not identify with a mountain neighbor of mine, Sandy Starr of Cedar Crest, as quoted in the Journal: "We spent a lot of time in front of the wood stove sleeping." (Interesting image of a subculture, that -- almost as insight-provoking as the quote from one Becky Ilagan of Malibu Beach, Calif., during a severe storm in 1983: "I knew it was all over when I saw the hot tub sail by into the ocean.") Me? Lots of X-C skiing, lots of shoveling, lots of pulling the bald-tired cars of city dwellers out of the snowbanks.

\* \* \*

**Neologism of the Month** A recent Colloquium Announcement mentions the "inevitable ambiguities of the real world." I doubt it's a telescoped version of "ambivalent antiquities"; I suspect it's another manifestation of a  $g = q$  phenomenon I've seen elsewhere -- most notably in a first-class hotel in Los Angeles, where several professionally done signs told guests that "Fire Extinguishers Are Located Next to the Elevators on Each Floor." Then there's the letter (from a commercial printer!) that invited me and my "quest" to attend a demonstration. ●BH

\* \* \*

Ande yo caliente y riase la gente. ("As long as I'm warm, let people laugh" -- the motto of Sandy Starr)



JANUARY RETIREES at Sandia Livermore are (from left): Moe Houk (8236), Perry Lovell (8260), Ort Thomas (8025), Don Clarin (8152), and Gene Springer (8025).



DECEMBER RETIREES at Sandia Livermore are (from left): Mickey Banfield (8273), Mo Robert (8413), and Carl Holmes (8183).

## LAB NEWS

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**SANDIA NATIONAL LABORATORIES**

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IRENE DUBICKA, Writer  
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RECENT STORM dumped about six inches of snow on Sandia, and the winds piled it four feet deep in some places. Clearing it over the last two weekends took extra effort by several organizations. "It was the freezing wind that made it [the snow removal] real hard that first weekend," says Ernest Gurule (7813), shown here (on a sunnier day) wading through the piles of snow removed from Area I streets and parking lots. As of Jan. 26, more than 150 truckloads of snow had been amassed on the mesas around the Tech Area.



# Supervisory Appointments



**COOK STORY** to supervisor of Test and Evaluation Division 8165 (newly created), effective Jan. 16.

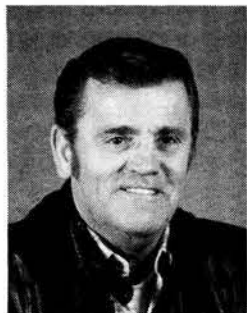
Cook joined Sandia Livermore in 1969, first designing weapon case parts in the W71 Spartan project group. After that he moved to a components group where he did transfer system work for the W76 Trident program. Next Cook was admitted to Sandia's Doctoral Study Program and earned his PhD in materials science at UC Davis in 1980.

Upon his return to Sandia, he joined the B83 group to help design the inertia-welded case for the modern strategic bomb. After that, he worked on the preliminary phase of the small ICBM and then assisted with engineering for the X-ray laser and other SDI-related programs. He also served recently as acting supervisor of the Materials and Processes Division.

In addition to his PhD, Cook has a BS and MS in mechanical engineering from Ohio State University.

He and his wife Sue live in Livermore. Cook's hobbies include bicycling, woodworking, vegetable gardening, target shooting, and attending ACT performances in San Francisco.

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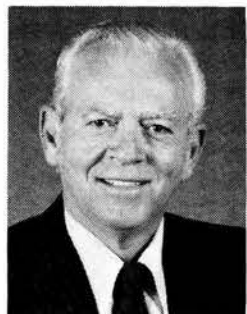
**WARREN (RICK) SEYMOUR** to supervisor of Mechanical Section 8413-1, effective Jan. 16.

Rick came to Sandia Livermore in 1980 and did heating and air conditioning work. Until then, he had worked in the Pleasanton Joint School District for 18 years in heating, air conditioning, and maintenance. Even before that, he had worked in construction.

His education in heating and air conditioning includes a four-year course through the Commercial Trades Institute in Chicago.

Rick and his wife Gabrielle live in Pleasanton. They have two sons, two married daughters, and three grandsons. His outside interests include camping and fishing.

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**JIM WALLACE** to supervisor of Grounds and Contract Maintenance Section 8413-4, effective Jan. 16.

Jim has been a member of Sandia's Electrical Section since he arrived in November 1985; before then, he worked on site as a contractor for Z Electric for several months.

Earlier, he was a supervisor for Reynolds Electrical & Engineering Co. at the Nevada Test Site. In all, he has 34 years of experience as an electrician.

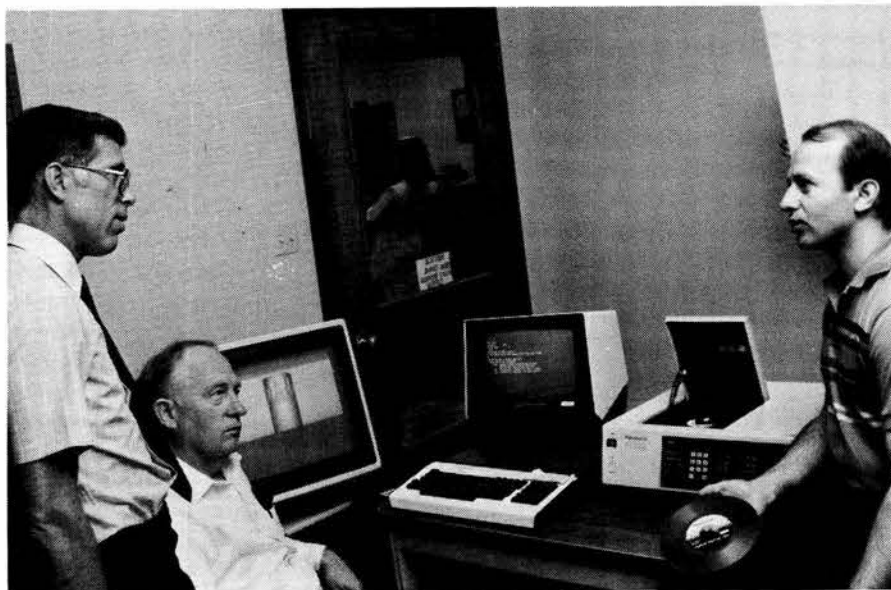
A native of the Bay Area, Jim graduated from Laney College as a journeyman electrician after a four-year apprenticeship.

Jim and his wife Billie live in Tracy, and have two married daughters and eight grandchildren.

His favorite pastime is freshwater fishing, and he has a motorhome and a boat that gets lots of use on inland lakes.

## Fun & Games

The Sandia Livermore Employees Golf Club has selected Paula Neighbors (8274) to receive its Golfer of the Year award for 1986. She received a certificate, a \$25 check, and a traveling trophy with her name added to it, which will be passed on a year from now to the 1987 winner.



TALKING OVER THE SUCCESS of their computer-generated graphics system are (from left) Mel Callabresi (8243), Verlan Gabrielson (8231), and Sam Paolucci (8245). The damaged shell appears on screen at left.

## From Acres of Numbers

# New System Provides Quick Graphics

It used to take days to reduce large quantities of computer output to graphic results. No more. Thanks to the Cray computers — and some judicious programming by a Sandia team — the time has been shortened to hours.

Large quantities of output are all too common. Structural analysis codes, for example, generate exceptionally large data sets. This means that analysis programs running on a Cray computer can produce such seemingly endless printouts of numbers that evaluation is difficult. But these vast amounts of data have to be made comprehensible if engineers are to interpret the results efficiently.

Recognizing the problem, Mel Callabresi of Mechanics of Materials Division 8243, Verlan Gabrielson of Computer Graphics Division 8231, and Sam Paolucci of Computational Mechanics Division 8245 began work more than a year ago on a system that allows quick and efficient interpretation of numerical data. Essentially, they wrote new software that enables Cray-generated graphics data to be recorded directly onto video optical disks. The system enables the analyst to generate a series of frames that interprets the data—in effect creating, quickly, an animated version of a computer simulation.

“The video optical disk system is like a videotape except that it also can randomly start and play back the frames at different speeds,” Mel explains. “Each compact disk stores 24,000 frames at a cost of approximately one cent a frame. Normal playback is at 30 frames a second, but the playback speed can be varied from zero [a still frame] to 200 frames a second. These video images may also be copied easily onto a videotape and used at presentations.”

## Easy Animation

The system uses a graphics file, generated on either one of the two Cray 1-S computers, which can then be used to create images on a separate graphics station. Mel and his colleagues wrote new programs, and adapted existing programs, both for formatting the graphics file and for driving the graphics terminal and disk recorder. The programs make

it possible to automatically display and record the data on the video optical disk recorder. They also wrote the software that programs the recorder for sequential playback (animation).

“Unless you're looking for a specific number or quantity, data printouts are becoming a thing of the past,” says Mel. “With 30 million words of Cray data, interpreting numerical results becomes a formidable and time-consuming task unless you can see what you're doing graphically. Viewing these data in an animated sequence allows you to observe transient events that are otherwise hard to detect. Using graphics, you can determine where to look and zero in on the important detail.”

## Aids Structural Analyses

For example, Vince Prantil (8242) put together a computer analysis to look at the effects of laser-induced buckling on a cylindrical shell, and to learn what load can be absorbed by the shell before crushing occurs. His use of the optical disk system allowed him to quickly evaluate and understand the results of his computer model.

“Another example involved an animation sequence for the W87 reentry vehicle,” notes Mel. “The model of its structural response to an accident scenario — being dropped on a rail during shipping and handling — showed an unexpected 1-inch indentation in the reentry vehicle. We knew this sudden deformation to the warhead was not correct, and, using the new graphics system, we spotted the problem immediately—the mistake was in our calculations of boundary conditions. We simply changed the conditions, and the program computed the structural response as expected.”

In addition to these examples, the computerized graphics system is being applied to the ice and earth penetrator programs and to rocket plume analysis.

The system was presented to the CUBE (Computer Use By Engineers) symposium last fall, and Verlan will discuss it at the DOE Graphics Forum in March.



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## Take Note

Wes Estill (8441) has been commended by San Joaquin Delta College in Stockton for his volunteer work there. He has served as chairman of the Electron Microscopy Advisory Committee for several years, and he headed a subcommittee of that group

to evaluate its technician program. He has been a guest speaker in classes on several occasions, and was instrumental in the college's obtaining a Siemens 101 transmission microscope as a donation from JEOL (Japanese Electron Optical Lab), USA.



## Take Note

The IEEE (Institute of Electrical and Electronics Engineers) Board of Directors has named Jim Gover (2126) an IEEE Fellow for his contribution to the exploration of radiation effects on electric components and nuclear systems. The IEEE Fellow status is conferred upon a person of "outstanding and extraordinary qualifications and experience in the IEEE-designated fields, and who has made important individual contributions to one or more of these fields." In all, there are only 3920 Fellows among the 274,000 IEEE members.

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"Survivability: An Emerging Discipline," is the third in a technical symposium series sponsored by Booz, Allen & Hamilton Inc. The lecture/discussion will be held Feb. 6 at 12 noon at the UNM Continuing Education Center. A Booz, Allen senior vice president (and former Sandian), David Durgin, will be the speaker. He will discuss the current and evolving threats to military systems and present a systematic approach for integrating survivability into the defense acquisition process. He will also provide recommendations for the near-term direction of U.S. survivability initiatives in the context of current DoD survivability programs.

The symposium series, "New Directions in Defense Science and Technology," is free to technical professionals in the Albuquerque area. Reservations are required. For more information, call Booz, Allen & Hamilton Inc. on 247-8722.

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Albuquerque has had its picture taken by NASA from 435 miles up, and you can have a copy of it. See if you can find your house from that altitude. The satellite posters are being sold by I.D. Resource Center, Inc., a publicly funded, non-profit group that assists in finding missing children, fingerprinting children and adults, and doing safety awareness programs in schools. The posters sell for \$20, with 20 percent of the profit going to the Center. For more information on this unusual poster, call Sandy Sawyer (6321) on 4-4363. Sandy is a member of the Center's board of directors. You can also stop by the Center (2923 San Mateo NE) and pick up a poster.

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Numismatic note: The Albuquerque Coin Club will collect Feb. 7-8 at the State Fairgrounds Opera House for the 27th Annual Coin Show. Hours are 10 a.m. to 6 p.m. on Saturday and 10 a.m. to 4 p.m. on Sunday. Admission and parking are free; use the San Pedro entrance. There will be prizes for the best exhibits and free appraisals. The Coin Club meets at 7:30 p.m. the last Monday of each month in the Sunwest Bank building (Central and Washington). For more info, call Boyce Nall on 298-3224 through Feb. 4.

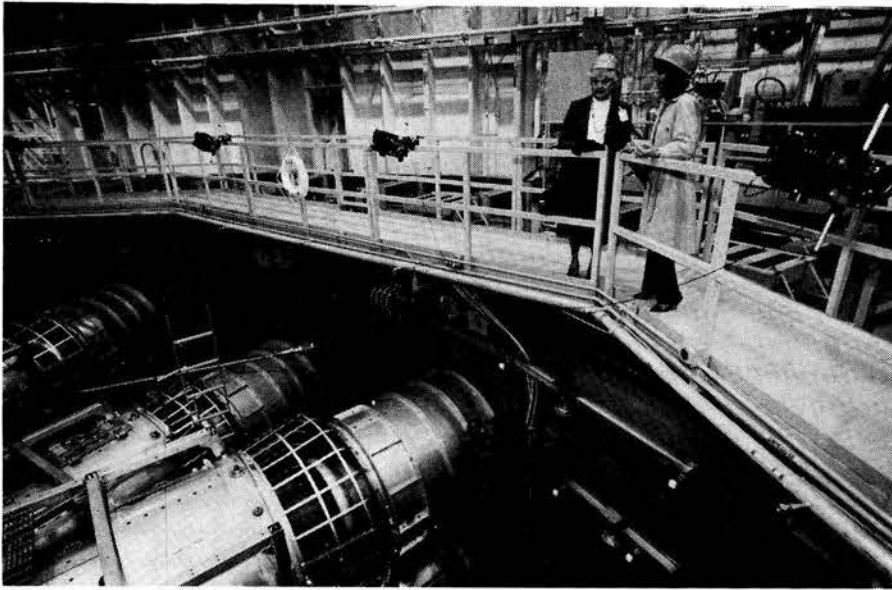
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Join the sparkling festivities this weekend as the New Mexico Museum of Natural History celebrates its first anniversary. The celebration begins tonight at the Museum from 8-10:30 p.m. under the theme "A Gem of an Evening to Celebrate a Jewel of a Year." The evening will highlight the Museum's newest exhibit, "Facets: A Calendar of Gems." Tickets are \$25/person.

The Museum will offer half-price admission on both Saturday and Sunday from 10 a.m. to 5 p.m. Special activities are planned. For more information, call the Museum on 841-8837.

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The APS Parent Center will present the 4th annual Mini Conference for Parents on Feb. 21 from 8:30 a.m. to 1 p.m. at Albuquerque High School (800 Odelia Rd. NE). The keynote address will be given by Judge Susan Conway, who will speak on "Parenting in a New Age." Registration is from 8:30-9 a.m., with the welcome and keynote address beginning at 9 a.m. There are two sessions to choose from; Session I is from 10 to 11:20 a.m., and Session II is from 11:35 to 1 p.m. Parents preregister to attend one seminar for each of the two session time slots. Interested parents can pick up a flyer/pre-registration form in the LAB NEWS office in Bldg. 814 or send a self-addressed envelope to Div. 3162.



BACK FROM WASHINGTON for an update on Sandia was Lucy Salazar, long-time administrative assistant to Rep. Manuel Lujan, the senior member of the state's Congressional delegation. During her visit, she was briefed by Arlyn Blackwell (400), Bill Marshall (6250), and Ralph Bonner (3500). She also toured PBFA II with Terry Martinez (1250; right).

## AT&T Savings Plans

The following are the Earnings Factors as of September 30, 1986, and October 31, 1986, for the AT&T Savings Plan for Salaried Employees (SPSE), AT&T Savings and Security Plan for Non-Salaried Employees (SSP), and the AT&T Voluntary Contribution Plan (VCP).

	Earnings Factors	
	Sept. 30	Oct. 31
<b>SPSE (Savings Plan for Salaried Employees)</b>		
AT&T Shares	.9351	1.0931
Government Obligations	.9942	1.0105
Equity Portfolio	.9139	1.0535
Guaranteed Interest Fund	1.0088	1.0091
Diversified Telephone Portfolio		
Unrealized Appreciation	.8744	1.0336
Realized Appreciation	.0062*	.0051*
<b>SSP (Savings and Security Plan - Non-Salaried Employees)</b>		
AT&T Shares	.9362	1.0918
Guaranteed Interest Fund	1.0091	1.0093
Diversified Telephone Portfolio		
Unrealized Appreciation	.8733	1.0328
Realized Appreciation	.0082*	.0053*
<b>VCP (Voluntary Contribution Plan)</b>		
AT&T Shares	.9363	1.0923
Mutual Fund Equity Portfolio	.9485	1.0185
Money Market Fund	1.0049	1.0048
Guaranteed Interest Fund	1.0091	1.0094
Diversified Telephone Portfolio		
Unrealized Appreciation	.8748	1.0327
Realized Appreciation	.0074*	.0048*

\* The 1 has been removed from the earnings factor. Current month's DTP earnings may be calculated directly: Earnings Factor x DTP Current Worth = Current Month's Earnings.

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Having trouble with the Tax Reform Act? The New Mexico Society of CPAs has professionals available to speak to groups or organizations on a variety of tax and financial matters, as well as the new tax act. Members can speak on personal financial statements, computer systems, family businesses, and personal financial planning. Choose from the above topics, or give the Society your idea and the members will find a speaker who knows something about

it. For more information, contact the Society on 262-1926.

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Retiring and not shown in LAB NEWS photos are: J. A. Allensworth (6414), Sidney Cook (7543), Jose Dominguez (3414), Robert Finnell (7523), Frederick Schelby (7545), Ted Varoz (3434), Carl Denney (7125), Carl Frostenson (9131), Nicholas Montoya (154), and William Wacek (5313).

## Welcome

### Albuquerque

Marie Garcia (3716)  
Michial McDuffie (3426)  
Fredrico Mora (2631)  
William Peters (3726)  
Michael Tebo (2112)  
Bernard Zimmerman (3426)

### Florida

Judd Hollister (3180)

### Georgia

David Womble (1422)

### Indiana

Daniel Garber (3151)

### Iowa

John Aurand (1235)

### Louisiana

Susan Ebrahimi (2334)  
Frank Trowbridge (6451)

### New Mexico

Caroline Tozzi (2631)

### New York

Paul Vianco (2532)

### Ohio

Lawrence Peepers (1552)

### Oklahoma

James Jones (2543)

### Utah

Michael Christiansen (9242)

### Washington

Daniel Lowe (5261)



## Saving Energy Gains Interest

# Yuletide Shutdown: Holiday with an Ulterior Motive

The extended holiday from Christmas through New Year's didn't just give Sandians the time to drive to Orono, Maine, for a family feast or to exchange the well-you-live-in-the-desert-dontcha gift of a gas barbecue grill for a snow-blower. The concurrent energy shutdown amounted to a savings of more than \$130,000 for Sandia Albuquerque. That's a BTU savings equivalent to 1454 tons of coal that can be left in the ground for future use.

It's not the first time. For 12 years now, the extended Christmas Energy Shutdown Program has given Sandians about a week off instead of scattered holidays such as presidential birthdays and Veterans Day. For nine of the 11 days (including two weekends) that Sandians were away the last time around, non-essential power was shut down and room thermostats were set back to minimum levels (55 degrees in most cases) wherever possible.

During each break, specially scheduled meter readings of electric and steam usage are taken to ensure that heating and cooling systems aren't set back too far or too long. (Cutting some back too much can be counterproductive when time comes to restore them to working order, a process that can take as long as two days.) Only a few buildings are exempt from the shutdown (see "Some Kept the Steam Up").

Electric and steam usage accounts for 99 percent of energy use at the Labs. Since 1974, when it first became apparent — because of the oil embargo — that the cost of energy sources was escalating rapidly, energy conservation has been institutionalized at Sandia.

Proportionally, the savings for the past year's break were 4.5 percent higher than for the 1974 holiday season. That first shutdown showed a 44 percent decrease (daily) in the electric bill for an average December day; the last one cut it by 47 percent, almost halving it. The savings for natural gas (for which costs are less than a tenth of the utilities bill in dollars) were 48 percent in 1986 compared to 1974's 31 percent.

## Battle for Energy Continues

Today the overall energy picture isn't much different. Although the days of long lines at gasoline service stations and curtailment of natural gas use are gone for now, amnesia is not in order. There seems to be plenty of oil and gas, and prices have dropped. But there are still solid reasons why we try to conserve, winter and summer.

As Jack Pitcher, contract employee to Plant Engineering 7862, reminds us:

- Since 1973, unit cost of electricity has increased by some 680 percent, natural gas by about 1100 percent.

- Sandia's projected cost for utilities in FY88 is \$11,290,000.

- Most energy sources are finite. Had we not conserved, the 1000-plus tons of coal Sandia saved last Christmas would be gone forever.

- Being conservation-minded at work may carry over to activities at home (where energy unit costs are even higher).

- Government-funded laboratories such as Sandia have an obligation to conserve energy, as specified in DOE Directive DOE/MA-0196.

- Another energy crunch is on its way, inevitably, and we need to stay in practice.

## Five Percent's Possible

About five percent of energy usage in FY87 can probably be saved this year, according to Jack, if conservation efforts continue. That level of savings would amount to more than \$560,000: about 6000

tons of coal. All it takes is a few simple steps:

- Turn off lights in unoccupied areas.
- Shut down computer terminals and PCs when they're not being used.
- Unplug or turn off all energy-using devices within your control, including lab equipment, when they're not needed.
- Remind your co-workers to cut unnecessary

power consumption.

- And, in general, renew the energy awareness in which we prided ourselves during the mid-70s.

Renewed interest in a conservation program is almost literally money in the bank for Sandia. Even more, each kilowatt saved preserves coal in the ground, a credit that we can draw on, some rainy — and cold — day. ●ID

## Visions of Software Danced in Their Heads

# Some Kept the Steam Up

'Twere the nights *after* Christmas when all through the Labs, not all was quiet — for example, the mouse. A computer mouse and other peripherals were stirring — and whirring — at the computer annex, Bldg. 880.

To begin with, the temperature-critical facility was exempt from the Labs shutdown. Yet the computer folks did more than leave the lights and heat on. Burdened with a backlog of work, they ran the equipment on a three-shift operation around the clock just to catch up halfway.

"We probably did more than \$1 million worth of work," says Kelly Montoya, manager of Communications and Operations Department 2630. "That sum is derived from what we would've billed the users at normal rates. It more than offset what we would have saved in electrical energy.

"We had gotten the newly delivered Cray X-MP/416 [see photo] operational a day or two before the break," Kelly continues. "We let people use it free of charge. We also charged users

half the rate for the Cray X-MP/24."

The task wasn't easy (not in the least because here was the Grinch stealing a piece of their Christmas). But it was successful. "From December 26th to the 31st, we had a skeleton crew composed of a dozen people who volunteered to come in," says Kelly. "We had two union people and a supervisor on each prime shift. And we rotated people to make it easy on everybody. Some came in at random on Christmas Day and the four days after New Year's just to spot-check the equipment."

While we revelers were nestled all snug in our beds, the computer folks in 2630 ran jobs for those users who also came in with deadlines. They had support from Plant Engineering (7810), systems programmers (2640), Security (3430), and Cray contractors.

As a result of the combined effort, the backlog was chopped from 2400 hours to 1000. Did we hear them exclaim as they completed their loads and drove out the gate: "Happy New Year's to all and to all a good byte"?



SUPERCRAY ROLLS OFF THE TRUCK, ready to be set up by the Cray people in Bldg. 880. Officially called the Cray X-MP/416, the new super-computer "will more than double — almost triple — the capability of central computing, putting an even larger load on it than we had last year with the X-MP/24," says Melvin Scott, supervisor of Scientific Computer Operating Systems Division 2641. For a price tag of close to \$23 million, Sandia gets four processors and 16 million words of main memory with 128 million words of fast secondary memory. The new Cray is for scientific use and will run CTSS (Cray Time-Sharing System) as the operating system.



## 6000 Reorganization

ment, and there's nothing I'd like better than to spend my last few years making Sandia a major player in meeting the challenges that face nuclear power in the 90s."

### Nuclear Power Needed for 90s

"And there will be challenges!" Bill continues. "Realistically, this nation has only two fuels — coal and nuclear — to provide the additional generating capacity we must have for the 90s and beyond. We'll need both of them, of course, but each has problems that must be solved first. On the nuclear side, those problems are both social and economic. To make NPPs [nuclear power plants] acceptable to society, we need to demonstrate that nuclear power generation is a mature and safe technology.

"And to make NPPs more economical — a 1000 megawatt plant now costs some \$3.5 billion with most of the expense incurred before the utility company is halfway through the 12-to-14-year construction phase — we need to develop new ways to construct them. Perhaps they can be built in increments, or modules, so that additional power can be added to a grid gradually, as needed, and so that the brunt of the expense doesn't occur years before the plants can begin paying for themselves. One economically more attractive plan would be to construct more NPP components in factories rather than in the field; that route is cheaper and could result in higher component quality and reliability.

"In other words," says Bill, "solving the problems surrounding future NPPs — revitalizing the commercial NPP program — means that we must capitalize on the nation's experience with the NPPs now on-line and on Sandia's experience in defining their safety and reliability for the NRC."

Such an initiative seems almost tailor-made for Sandia, its people, its tech base, its experience, and its capabilities. After all, as Bill points out, it's the non-nuclear components of NPPs — sensors, controllers, seals, valves, actuators, pumps, etc. — that need redirected attention; the nuclear package is a proven and reliable technology. So it's analogous to the nuclear defense field, where Sandia's mission is to engineer a nuclear device into a safe, reliable, and effective nuclear weapon.

### Space Nuclear Power Systems

The new directorate will also continue applying Sandia's capabilities to civilian and military needs for space-based power systems in the 90s. On NASA's drawing board, at least, are plans for manned and unmanned space platforms and lunar stations; ahead lie plans for colonies on Mars, perhaps in the 2020-50 period.

All of these will demand at least hundreds of kilowatts of electricity, far more power than kilowatt-level devices such as the SNAP-10A (Systems for Nuclear Auxiliary Power) and similar USSR power generators now in orbit. And the new devices will face stringent constraints: weight, volume, remote controllability, reliability, and robotic maintainability. If the devices are used with manned stations, the need for such controllability and maintainability is decreased, but the need for safety and reliability skyrockets, figuratively speaking.

Again, as Bill points out, it's the non-nuclear design that's going to be the challenge — the nuclear heat source itself poses fewer problems, but what about converting that heat to electricity, conditioning the power to meet the needs of a variety of applications, ensuring safety during launch (and during reentry, whether deliberate or accidental), and providing the capability for nearly autonomous control (and (often) remote maintenance? And, again, these are Sandia-type challenges.

"After all, Sandia's non-nuclear expertise is

unmatched in the national labs," says Bill. "Non-nuclear technology has been, and will continue to be, our primary focus."

In the military arena, less can be said, but several advanced defense concepts will need nuclear power supplies. And other new types of defensive weapon systems that would be deployed as an outgrowth of SDI will require power and specialized power conditioning.

### Snyder on New Group's Role

"Our new organization will do the thinking necessary to define the role that Sandia could or should play, a role compatible with our mission, our capabilities, and our tech base," says Bill. "And we'll look at the changes needed to position the Labs strategically to participate in these new endeavors. If we're a success in demonstrating the value of Sandia technology in the applications we'll be looking at, then we could reach 200 FTEs [full-time equivalents] by 1995.

"The concept underlying 6500 goes back to some discussions I had with Al Narath [then Research VP at Sandia, now VP of Government Systems, AT&T Bell Labs] in 1978," Bill continues. "Then last year as I was briefing President Welber on our role, he deplored the state of the NPP industry in this country and later challenged me to do something about it. And now I think the time is right.

"I'm not talking now only of Sandia," Bill notes. "That 'time is right' feeling is bolstered by the growing awareness that the nation needs to revitalize American industry in general. One of the most promising ways to do that is to forge closer alliances among industry, universities, and national labs. In the specific area we're concerned with, there's a clear need for improved product in commercial nuclear power.

"I believe that we have a 20- to 50-percent chance of complete success," Bill concludes. "When I made my reorganization proposal to Dan Hartley, he jumped at it. After all, when you weigh the risks versus the benefits, it's really a low-risk venture — if we fail, we're no worse off than we are now. And if we succeed, Sandia will have helped our nation move toward energy self-sufficiency.

"When Dan mentioned our success probability to Small Staff, President Welber responded, 'Maybe it's only 10 percent. If we don't try, it's zero.'"

"I was very pleased at how all of Small Staff endorsed the concept," says Dan, "and I'm especially pleased about Bill's excitement in taking on the challenge. We're off and running!" ●BH



## McCloskey Named Director of 6400

Dave McCloskey, currently manager of Engineering Analysis Department 1520, has been named to succeed Bill Snyder as director of Nuclear Regulatory Research 6400, effective Feb. 1.

Dave joined Sandia in 1966 as a technical staff member in the Weapons Effects Research Department where he performed research on the vulnerability of reentry vehicles to nuclear weapon effects. In May 1969, he was promoted to supervisor of Defense Technology Studies Division. In Oct. 1973, at the beginning of Sandia's work on commercial nuclear power safety, that division became Reactor Safety Studies Division. Dave was promoted to manager of Nuclear Fuel Cycle Safety Research Department 6410 in August 1975. He moved to Engineering Analysis Department 1520 in August 1983.

About his return to Org. 6400 Dave says, "I'm delighted with this opportunity to rejoin the outstanding nuclear power safety research effort in 6400. During the past dozen years, Sandia has developed a worldwide reputation for its excellence in many diverse areas of nuclear safety research, including experimental and theoretical investigations of severe reactor accidents, qualification testing of nuclear power plant equipment, containment integrity, evaluation of reactor system reliability and risk, and performance assessment of nuclear waste repositories."

(Continued on Next Page)



WELCOMING participants at a national symposium in Albuquerque on space-based nuclear power systems is Dan Hartley, VP for Energy Programs 6000. He pointed out that "Sandia's created a new thrust in space nuclear power by establishing a new directorate in that area. We're committed in a big way to our SP-100 and Multi-Megawatt programs and hope to see them grow." Dan also described Sandia's roles in risk assessment, instrumentation and control, and conceptual evaluation. More than 200 papers were presented at the mid-January conference, which was co-sponsored by UNM's Institute for Space Nuclear Power Studies, LANL, SNL, and other organizations.



# Monitor

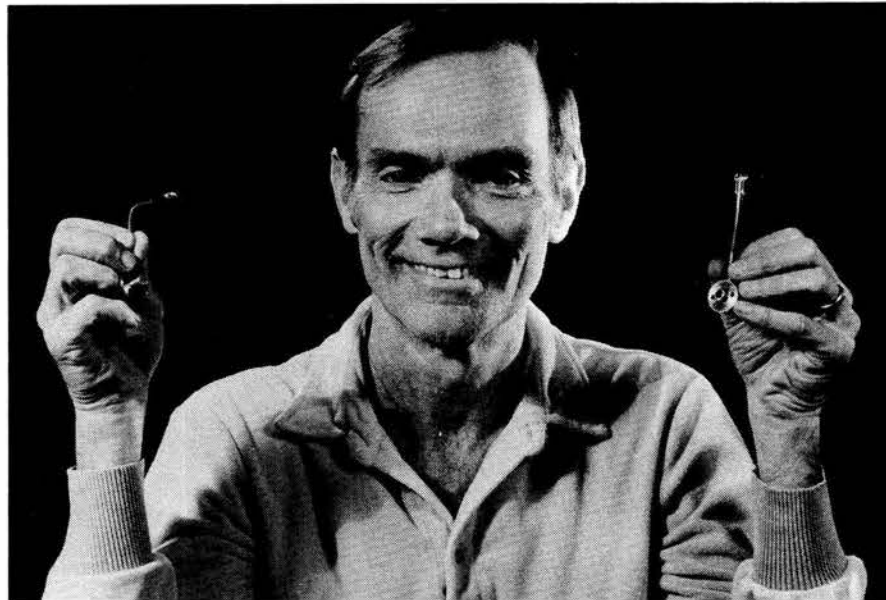
Pat Walter, supervisor of Test Measurements and Precision Centrifuge Division 7545, considers Bob Graham's (DMTS, 1131) many years of shock wave physics research on crystals (and on lithium niobate in particular) a key to successful monitor development. "Bob is considered one of the world's experts in this field," says Pat, "and we consulted with him throughout the development process."

## Second Generation Version

Dick is working on a second generation device with a self-check feature that will enable stockpile samplers to check the monitor's functional integrity just before it's used for pressure wave measurements. Development on the new version began last July; final qualification is anticipated in February or March of 1988.

"The self-check system centers on a 40-ohm tantalum resistor sputtered on the positive side of the lithium niobate crystal," explains Dick. "When we pulse the resistor, it heats up fast, causing the crystal to generate a pyroelectric output that tells us if the monitor is working as intended."

Steve Kuehn (7545), who had responsibility for a year-long feasibility study on the self-check system, chose the pyroelectric output effect after inves-



DICK PRECIT (7545) led the development effort on a detonator monitor now used in the nuclear weapon stockpile sampling program. In his right hand (left of photo), Dick displays the original version now being produced by GE. Under development is a second-generation device (right) with a self-check feature.

tigating various approaches. Mike Rogers (also 7545) did the original feasibility study to determine if lithium niobate would work for monitoring the pressure characteristics of explosive detonators.

## Production Under Way

The General Electric Neutron Devices (GEND) Department at Largo, Fla., is producing the first-generation detonator monitor. GEND began production of the device in August 1985, following a two-year development effort supporting Sandia's inves-

tigations. "We chose GEND to manufacture the device because of its long-time experience in both crystals and explosive work," says Dick.

Hank Bundy, component engineer at GEND, worked with the Sandia development team to ensure the manufacturability of the monitor. Roy Bruner, Hank's supervisor, had responsibility for technical management of the monitor effort at GEND.

A patent application has been filed in the names of Dick, Bob, Steve, Mike, and Hank. The application covers a combination of features from the original and second-generation devices. ●PW

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# McCloskey

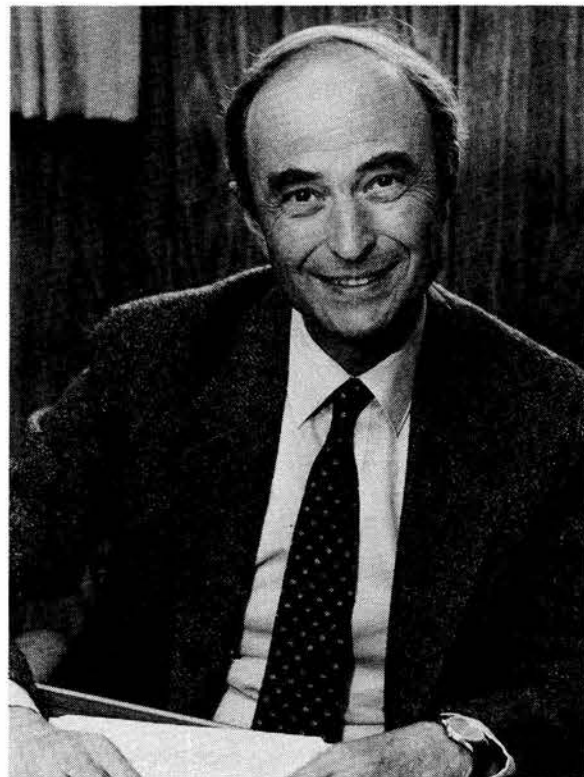
"Org. 6400 has traditionally supported NRC [Nuclear Regulatory Commission] programs," says Dave. "And it will continue and strengthen those activities."

"I'm also really excited about our new initiatives in support of SDI and conventional munitions," he says.

Directorate 6400 projects include experimental reactor support of advanced SDI concepts, work in advanced munitions concepts, and a new initiative to develop approaches and concepts for the design of survivable space assets.

Dave's educational background includes a BS in chemical engineering and an MS in mechanical engineering, both from Stanford. He received a PhD in engineering science and applied mathematics from Cal Tech.

Active as a Cub Scout leader and in youth sport activities, Dave also enjoys skiing and outdoor activities. Dave and his wife Joanne have two children and live in SE Albuquerque.



WIL GAUSTER (6510)



KEN REIL (6423)

# Supervisory Appointments

WIL GAUSTER to manager of Exploratory Nuclear Power Systems Department 6510, effective Feb. 1.

Wil joined Sandia Albuquerque in 1966 as a member of the Solid State Physics Organization where he did research on optical properties of semiconductors and studies of thermal mechanical effects in solids using lasers and electron beams. In 1974-75, he was a guest scientist at the nuclear research center in Juelich, Germany (KFA), where he began research on positron annihilation. After returning to the Labs, he continued that research in the Ion Solids Interactions Division. He also began a program in muon spin rotation at the Los Alamos Meson Physics facility. Wil was promoted to supervisor of Physical Research Division 8347 at Livermore in 1979. The group in Livermore was instrumental in establishing Sandia's program in magnetic fusion energy; and it was during his stay there that Wil became involved with international collaborations, including the one on advanced limiter development with the TEXTOR facility in Juelich, Germany. Wil returned to Albuquerque in 1982 as supervisor of the Fusion Tech-

nology division.

Wil has an AB in applied physics from Harvard and a PhD in physics from the University of Tennessee. (He did his thesis work at Oak Ridge National Laboratory.) He is a member of the American Physical Society and the American Vacuum Society.

In his spare time, Wil enjoys traveling, sports, music, and reading. He and his wife Norma have two children and live in the NE Heights.

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KEN REIL to supervisor of ACRR Reactor Safety Experiments Division 6423, effective Nov. 1.

Ken joined Sandia in April 1976 as a member of the reactor safety research organization. He has remained in that organization since then. All of his work has involved in-pile experimental projects.

Ken has a BS in engineering science from the University of Nevada at Reno, and an MS and PhD from UNM, both in nuclear engineering. He is a member of the American Nuclear Society.

In his spare time, Ken enjoys woodworking and gardening. He and his wife Elizabeth have two children and live in the NE Heights.

# Fun & Games

**Bowling** — SANDOE December Bowler-of-the-Month awards went to: Men's Scratch, David Norwood (2122), 633; Women's Scratch, Dorothy Castro (DOE), 524; Men's Handicap, Glenn Folkins (5153), 670; Women's Handicap, Arlene Dyckes (2110), 646.

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**Volleyball** — Here are the SERP Volleyball Association fall winners for the regular season and tournament play: A League - regular and tournament, Bob Eyers' team; B League - regular season, Mike Castro's team; C League - tournament play, Bill Ballard's team; C League - regular and tournament, Scott MacKinnon's (2132) team.

The Volleyball Association general meeting (for all coaches and interested players) is set for Feb. 9 at the Coronado Club from 5-7 p.m. The fall season awards will be distributed. Refreshments will be served.

Deliver rosters for the spring season by noon on March 12 to Stan Ford. The season is scheduled to start April 6.

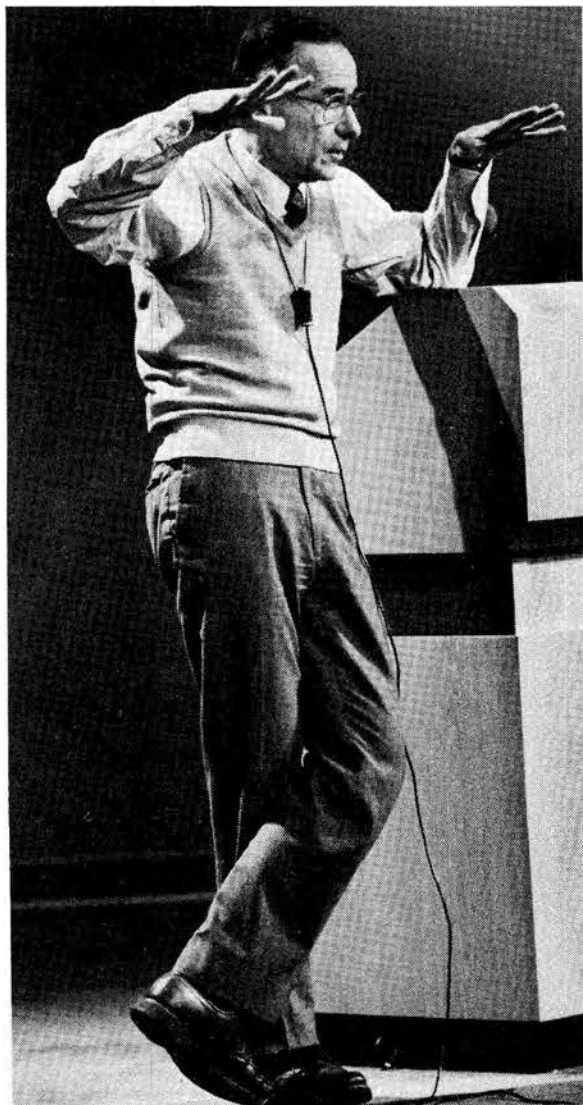


# Events Calendar

- Jan. 30-Feb. 1* — "K2" (after a climbing accident, two men struggle for survival on the world's second highest mountain); 8 p.m. Fri.-Sat., 6 p.m. Sun.; Vortex Theatre (Central & Buena Vista), 247-8600.
- Jan. 30-Feb. 2* — "Maya, Treasures of an Ancient Civilization"; 11 a.m.-5 p.m. Tues., 1-9 p.m. Wed., 11 a.m.-9 p.m. Thurs.-Fri., 10 a.m.-5 p.m. weekends; Albuquerque Museum, 243-7255 or 242-4600.
- Jan. 30-Feb. 4* — Exhibit, "Terra Maya," photos depicting Mayan art and architecture based on nature; New Mexico Museum of Natural History, 841-8837.
- Jan. 30-Feb. 6* — "The Maya," photographs by archaeologists, featuring Peter Harrison; and "Illustrations of Ancient Tikal," featuring Peter Spier; South Broadway Cultural Center, 848-1320.
- Jan. 30-July 31* — Exhibit, "Maya: The Image from the Western World"; 9 a.m.-4 p.m. Mon.-Fri., 10 a.m.-4 p.m. Sat.; main gallery, Maxwell Museum of Anthropology, 277-4404.
- Jan. 30-Feb. 8* — "Baby," musical focusing on three couples as they progress together through the nine longest months of their lives; 8 p.m. Tues.-Fri., 6 & 9 p.m. Sat., 2 p.m. Sun.; Albuquerque Little Theatre, 242-4750.
- Jan. 30-Feb. 15* — New Mexico Repertory Theatre's production of "The Taming of the Shrew"; 8 p.m. (2 p.m. Sun.), KiMo Theatre, 243-4500.
- Jan. 30-31* — "Romeo and Juliet," classical ballet by the Southwest Ballet Company; 8:15 p.m., Popejoy Hall, 294-1423.
- Jan. 30-Feb. 1* — Antique show and sale; 12-9 p.m. Fri., 12-8 p.m. Sat., 12-6 p.m. Sun.; Albuquerque Convention Center, 268-5122.
- Jan. 30-Feb. 8* — "People of the Forest," photos of a contemporary Mayan tribe, the Lacandon of Chiapas, Mexico, by Gertrude Blom; 10 a.m.-5 p.m., Albuquerque Museum, 243-7255.
- Jan. 30-Feb. 8* — Exhibit, "Yucatan Earthscapes and Views of Ancient Monuments," aerial photos of Mayan temples by Marilyn Bridges; drawings by Frederick Catherwood, one of the first explorers to catalog Mayan ruins; Albuquerque Public Library, 768-5150.
- Jan. 30-March 1* — "Today's Maya," an exhibition of photos by Jose Kuri Brena; 8 a.m.-5 p.m., KiMo Gallery, 848-1370.
- Jan. 31* — Hispano Chamber of Commerce Annual Banquet with Geraldo Rivera as the keynote speaker, Convention Center, 842-0220.
- Jan. 31* — "Zookids," animal education program for 4- and 5-yr.-old children and their parents; features music, stories, games, and hands-on experience with animals; 1-3 p.m., Rio Grande Zoo, 843-7413.
- Feb. 1* — Chamber Music Concert, annual concert performed by various ensembles drawn from the Albuquerque Philharmonia Orchestra's membership; 3 p.m., St. Andrew Presbyterian Church (5301 Ponderosa NE), 265-0283.
- Feb. 1* — Sinfonietta II, Roger Melone conducting and performing on the harpsichord, all-baroque program performed chamber-style; 3 p.m., Albuquerque Academy Auditorium, 843-7657.
- Feb. 1* — Central New Mexico Audubon Society Nature and Wildlife Film Series: "North to the Top of the World," by John Wilson; 7:30 p.m., Popejoy Hall, 881-9387 or 255-0307.
- Feb. 2* — Showtime at the KiMo, World Series: Phil Coulter's Pops Orchestra of Ireland, a concert of international and Irish favorites; 8 p.m., KiMo Theatre, 848-1374.
- Feb. 4* — The Hungarian Folk Ensemble, a company of 100 dancers, with chorus and orchestra; 8:15 p.m., Popejoy Hall, 277-3121.
- Feb. 8* — Sinfonietta III — Choral Fest; New Mexico Symphony Orchestra Chorus hosting the Albuquerque Academy Choral Ensemble and the Original Scorpion Hollering Band from Farmington High School; 3 p.m., Albuquerque Academy Auditorium, 842-8565.



AGAINST A HIGH-TECH SCULPTURE backdrop (it was once the heart of PBFA I), Executive VP Orval Jones (20) chatted with two Congressional visitors last month. On the left is Wyoming Senator Malcolm Wallop, a member of the Senate Finance, Energy, and Natural Resources Committee; on the right is New Jersey Representative James Courter, a member of the House Armed Services Committee. Not shown is New York Representative Jack Kemp, a member of the House Appropriations and Budget Committees. All three were briefed on Sandia's SDI programs by Irwin Welber (1), Roger Hagengruber (9000), Pace VanDevender (1200), Rick Wayne (8400), and Bob Clem (9100).



## Congratulations

To Dale Hornsby and Larry Carrillo (7131), married in Las Vegas, Nev., Jan. 17.

## Sympathy

To Angie Black (3426) on the death of her grandfather in Albuquerque, Dec. 18.

To Patsy Mahan (3426) on the death of her brother in Ft. Worth, Dec. 20.

To Ursula Besse (3426) on the death of her father-in-law in Germany, Dec. 20.

To Marvin Barnett (5143) on the death of his father-in-law in Kansas, Jan. 5.

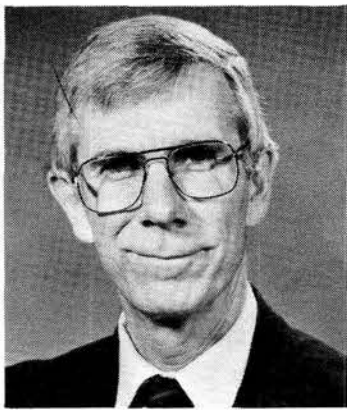
COMPUTER AS EMPEROR has no clothes, according to Arno Penzias, VP for research at AT&T Bell Labs — where he shared the 1978 Nobel Prize for his work in confirming the "big bang" theory of the creation of the universe. The Colloquium speaker described the counterproductive confusion between white-collar workers and computers: The former often use context and seat-of-the-pants fixes while the latter are purely logical. "People operate much more intuitively than they think they do," he said. "If an organization doesn't understand that, it can spend a lot of time fighting itself instead of fighting problems." His advice? Find trusted leaders and don't constrain people with absolute rules.



# MILEPOSTS

## LAB NEWS

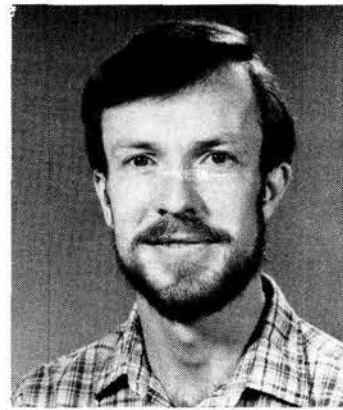
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Jim Henderson (7261) 10



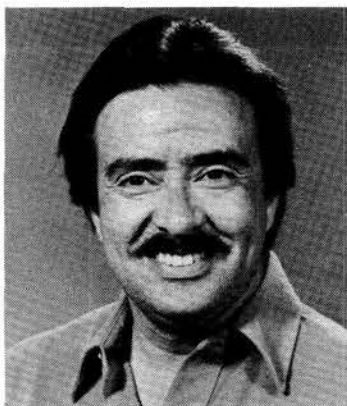
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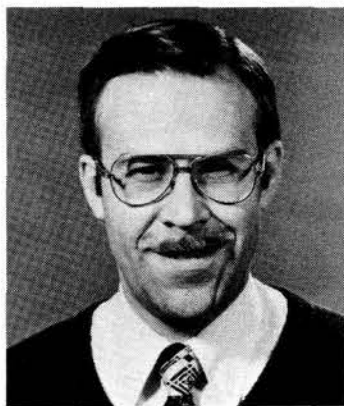
John Harrington (5267) 10



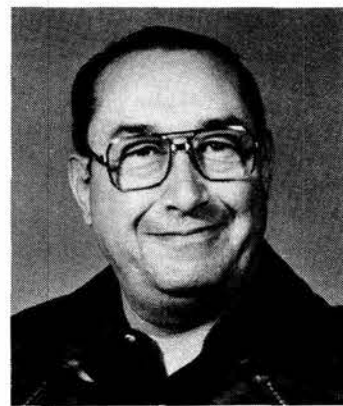
Randy King (1617), 20 yrs.; Bill Childers (1617), 25 yrs.; Art Sena (1617), 20 yrs.



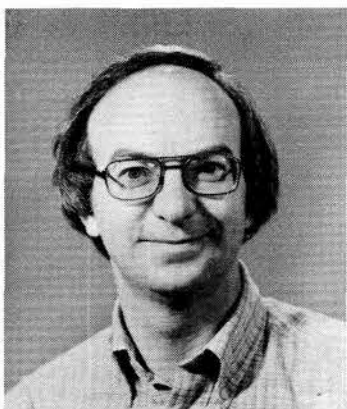
Leroy Perea (7556) 15



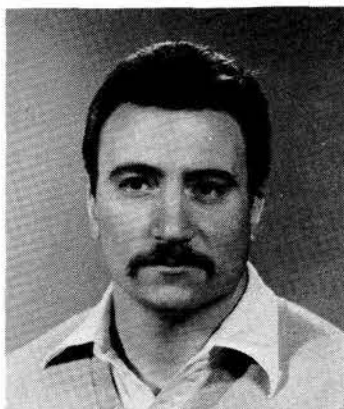
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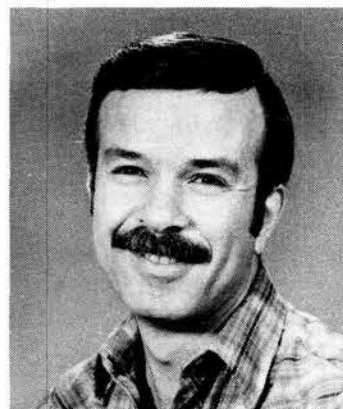
Al Trujillo (5141) 30



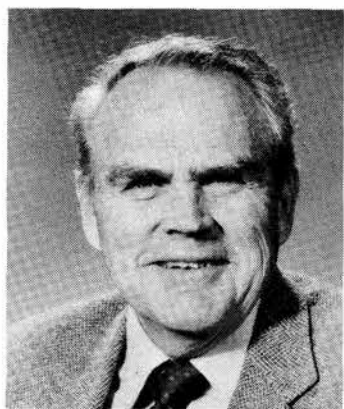
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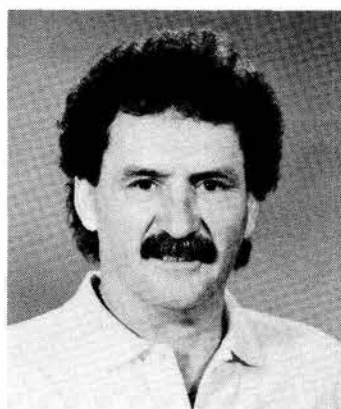
Richard Cernosek (7555) 10



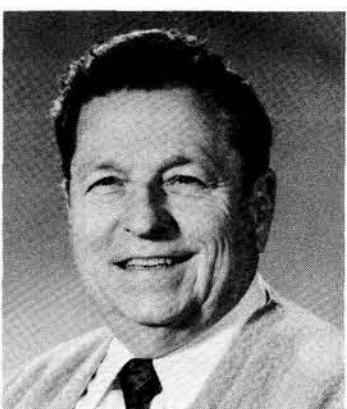
Dennis Kramer (2122) 15



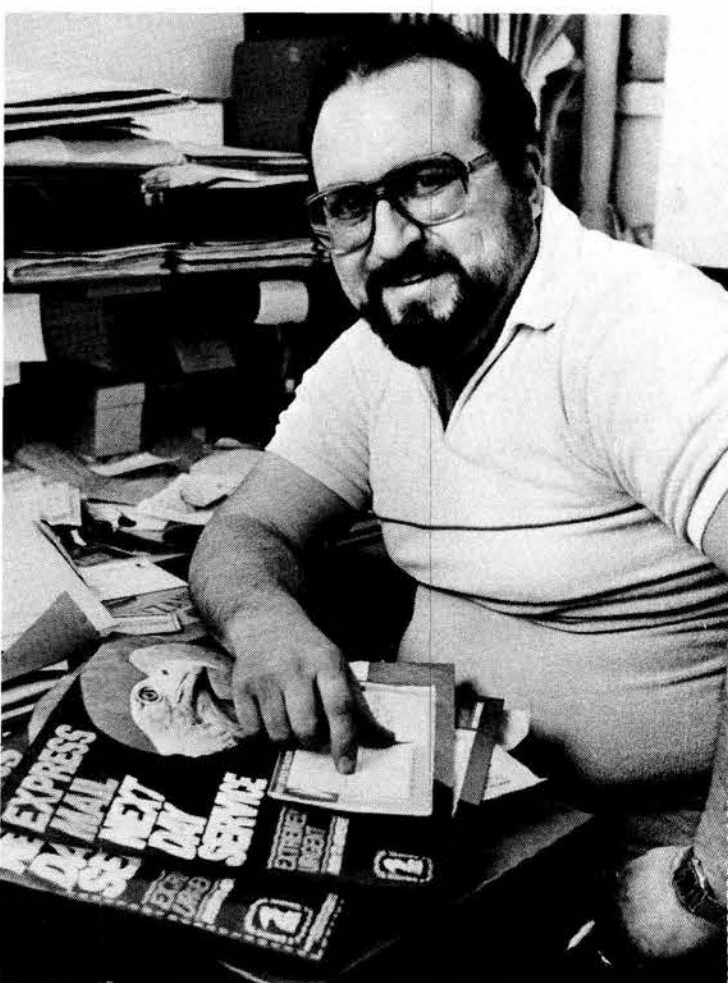
Edwin Johnson (5251) 35



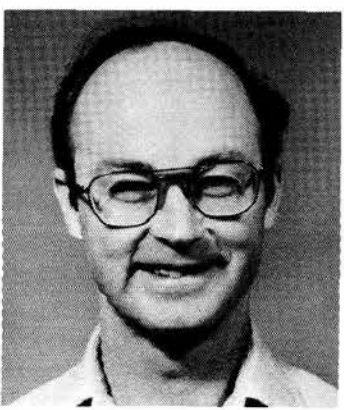
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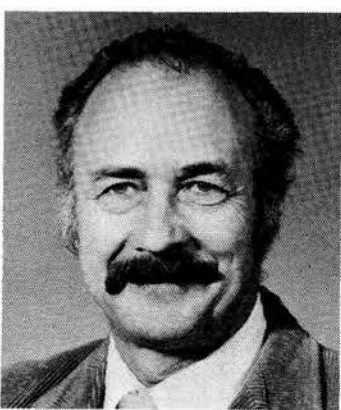
Russ Acton (7537) 30



Cecil Tafoya (3154) 20



Ray Decker (7242) 15

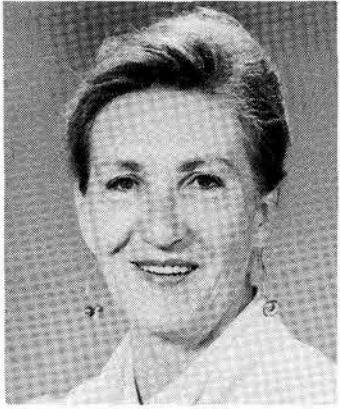


Rip Anderson (6334) 25

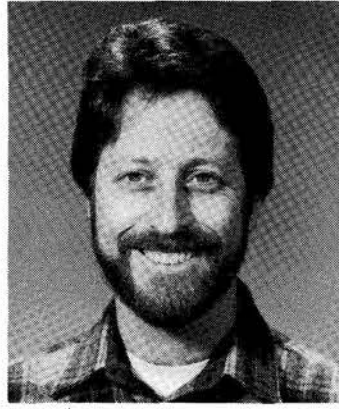


Lorenzo Garcia (7475) 35

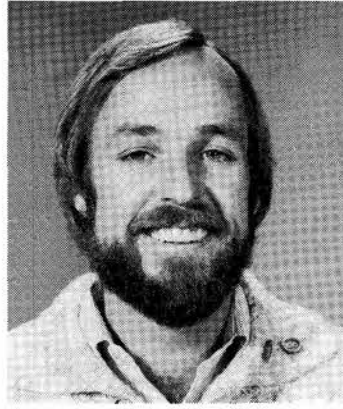




Sharon Romero (155) 10



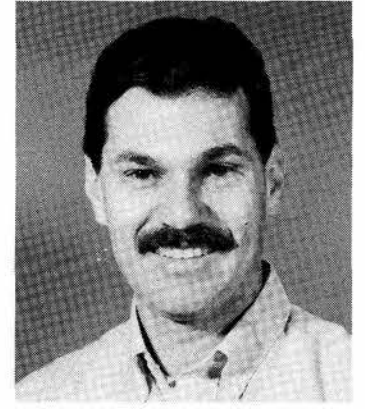
John Fuller (2346) 10



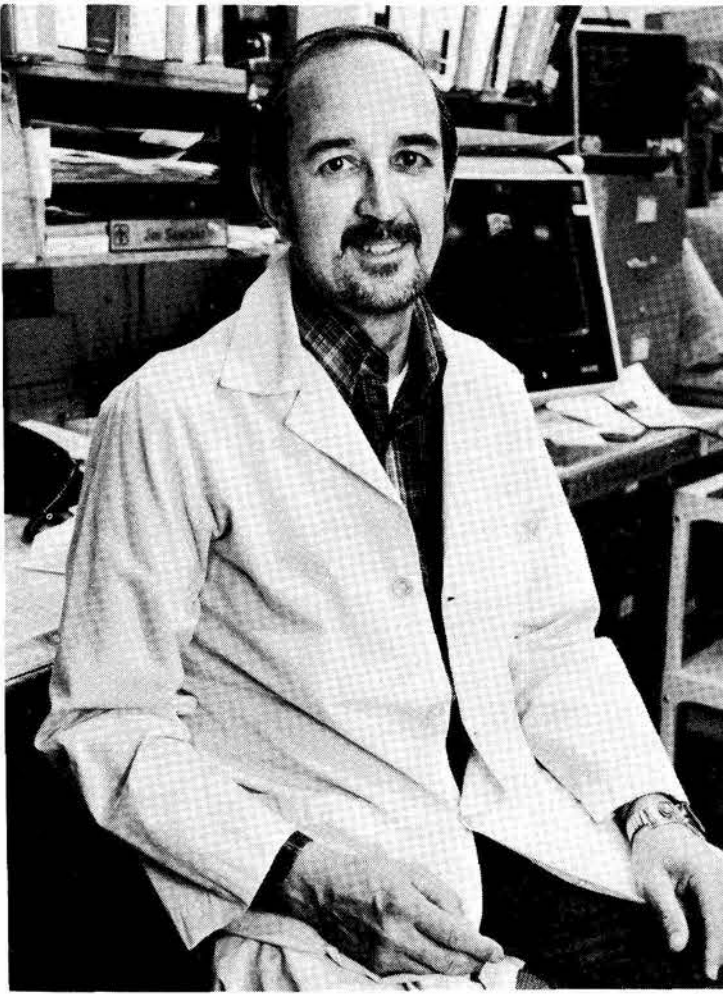
Paul Johnson (5214) 10



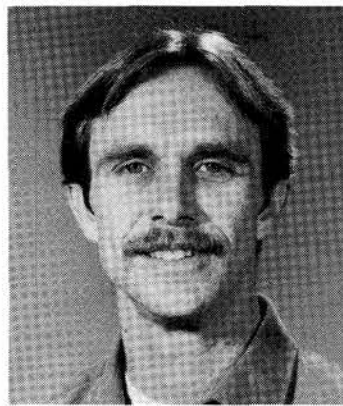
L. A. Washington (7522) 10



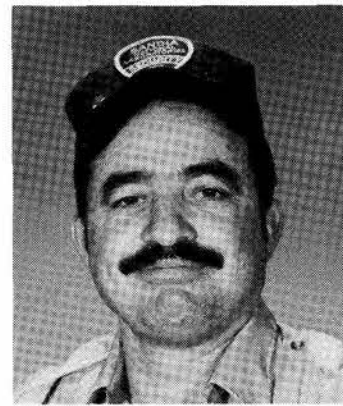
Charlie Randour (9234) 10



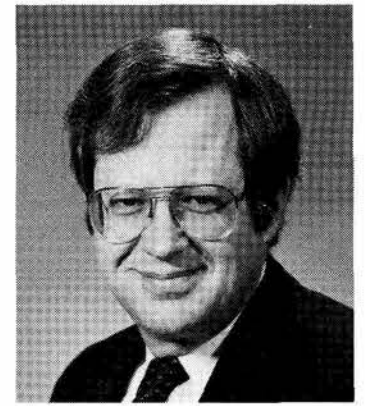
Jim Sanchez (3414) 30



Duane Patrick (7535) 10



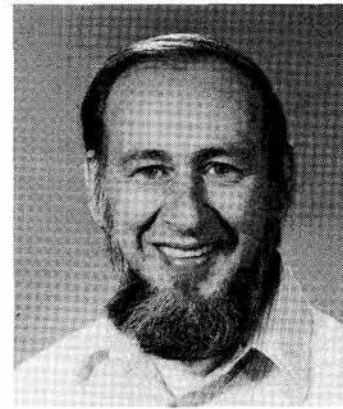
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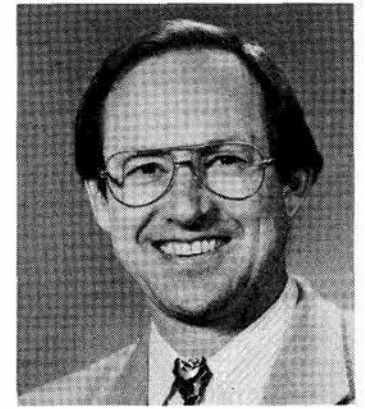
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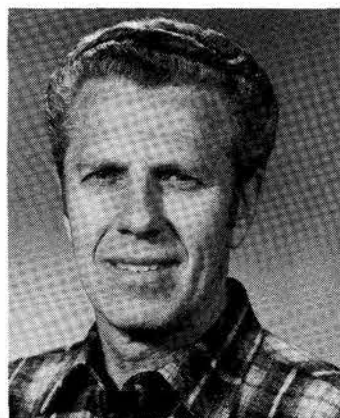
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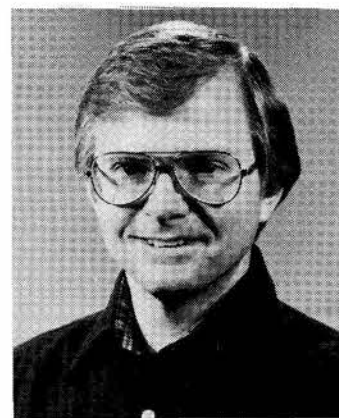
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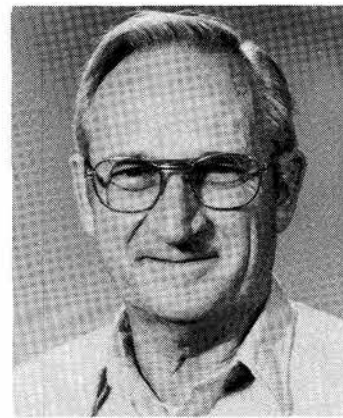
Tom Hunter (6310) 20



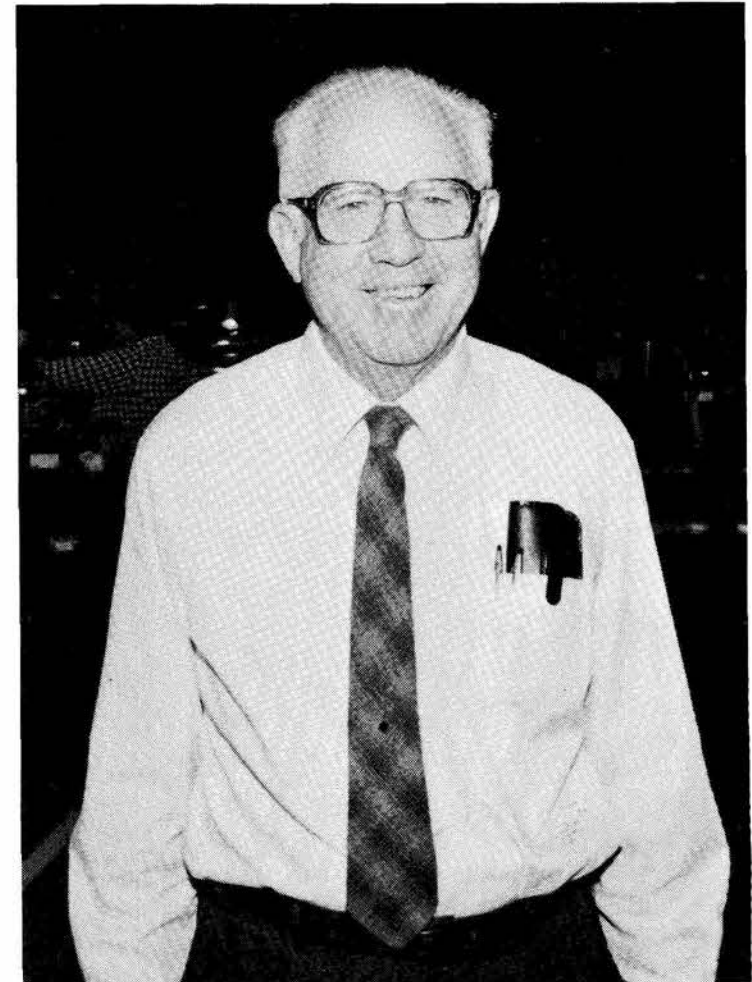
Ken Wischmann (DMTS,7472) 20



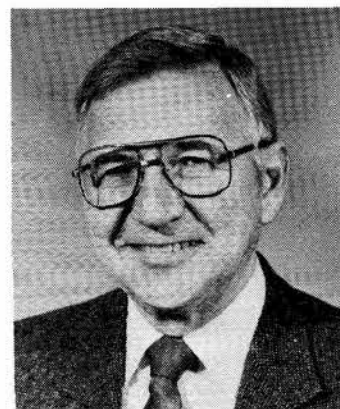
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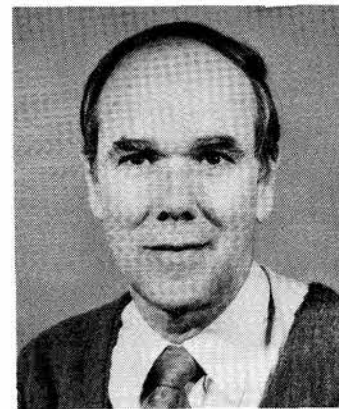
Bob Wehrle (2522) 35



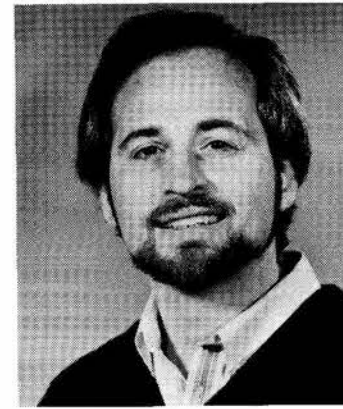
Val Black (8184) 40



Ray Reed (DMTS,7116) 25



Bob Clark (2525) 25



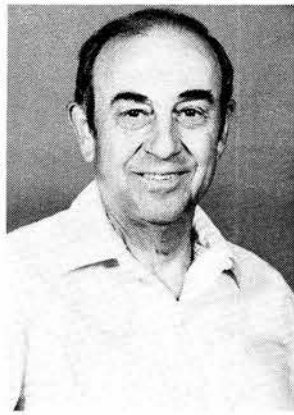
Rick Eisler (1555) 10



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Gene Harrison (3428) 22



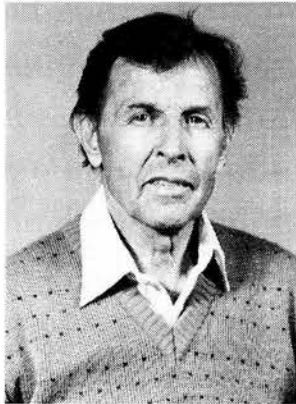
Ed Rightley (9143) 29



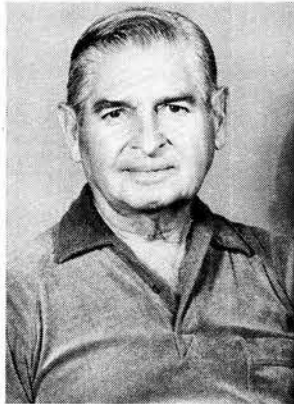
Don Hurt (7213) 29



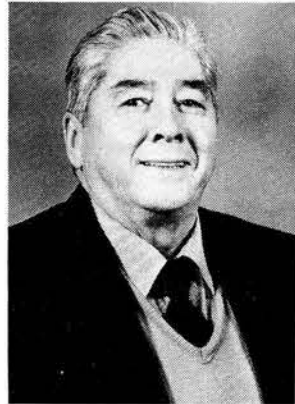
Berry Gilkes (3153) 25



Rubel Romero (3155) 21



Leo Ortiz (3155) 40



Wally Hunt (5246) 30

**Edison as Entrepreneur**



Thomas A. Edison "commanded an unusual talent as a promoter of his inventions . . . He unveiled his devices with flamboyant showmanship when such drama would benefit him. For example, in December 1880 he and his legal counsel and friend, Grosvenor P. Lowery, staged a major demonstration of the Edison lighting system at Menlo Park for the city officials of New York, seeking their agreement to approve preparations for an Edison power station in lower Manhattan. Concluding the dramatic early-evening tour, the group was escorted to a spacious room on the second floor of the main laboratory building, where the walls were lined with bottled chemicals. Dominating the room were long tables decked with rare vintage wines and delicacies from the kitchen of the most famous chef in the US, Lorenzo Delmonico. Immaculate waiters in swallowtail coats and white gloves stood at attention as Lowery clinked glasses in toasts to Edison and solicited testimonials from the officials, bathed in the light cast by Edison's incandescent lamps . . . Edison's fusion of technical creativity with promotional skills and sensitivity to the marketplace undoubtedly contributed to the commercial success of many of his products."

Reese V. Jenkins and Paul B. Israel, *IEEE Spectrum*

**Built-In Mini-Microwaves?**



High-tech gizmos proliferate as auto makers seek a competitive edge. [Some] devices displayed at recent auto shows include Toyota's roof-top solar energy cells that power parked-car cooling and windshield wipers that turn on automatically when it rains. Pontiac displays a computer that helps navigate the car and makes hotel reservations. Ford talks of sonar obstruction-detection for parking.

How much the consumer will pay for such items is the unanswered question. "All these bells and whistles cost money," a Ford spokesman says.

*Wall Street Journal*

**UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS**

Deadline: Friday noon before week of publication unless changed by holiday. Mail to Div. 3162.

**Ad Rules**

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2. Include organization and full name with each ad submission.
3. Submit each ad in writing. No phone-ins.
4. Use 8 1/2 by 11-inch paper.
5. Use separate sheet for each ad category.
6. Type or print ads legibly; use only accepted abbreviations.
7. One ad per category per issue.
8. No more than two insertions of same ad.
9. No "For Rent" ads except for employees on temporary assignment.
10. No commercial ads.
11. For active and retired Sandians and DOE employees.
12. Housing listed for sale is available for occupancy without regard to race, creed, color, or national origin.

**MISCELLANEOUS**

- 35mm CAMERA, Cortland CX-7, \$35; cordless telephone, Mura, \$35. Padilla, 842-8068.
- CHAIR, recliner, brown tweed; maple end table w/magazine compartment; twin-size maple headboard w/metal frame. Pitti, 256-1629.
- HIDE-A-BED COUCH w/matching loveseat, plaid design, \$150/both. Kerschen, 292-8001.
- DINETTE TABLE, new, glass and brass, 6 chairs, \$100; heavy wood dinette table w/upholstered chairs, \$200. Mayer, 299-8524.
- BABY FURNITURE: Childcraft oak crib/youthbed, cost \$550, sell for \$200; high chair, \$15; one-step car seats, \$15/ea. Miller, 344-8068.
- KEROSUN HEATER, portable, \$150; sewing machine, old industrial Singer w/new table, \$250; manual typewriter, \$20. Madden, 296-1082.
- VAPORIZER, warm steam, Hanksraft deluxe model, automatic shut-off, runs up to 24 hours, cost \$15, sell for \$5. Barr, 821-5870.
- PIANO, less than \$400. Snyder, 898-5962.
- HOSPITAL BED, semi-electric, w/mattress and side rails, \$700. Austin, 298-5352.
- WASHER AND DRYER, J. C. Penney, avocado, \$175/set; Frigidaire refrigerator, harvest gold, 17 cu. ft., w/icemaker, \$200. Gillings, 884-0853.
- PUPPY, Irish wolfhound/Labrador retriever cross, 7 weeks old, female, free to good home. Dubicka, 296-6557.
- WEIGHT SET w/incline bench, includes

- EZ-curl bar, straight bench, curl and dumbbell bars, and approximately 325 lbs. of weight, \$80. Hughes, 883-8784.
- BALDWIN GRAND PIANO, 5'8", ebony, owned by professional musician, \$7800. Hoffman, 292-1478.
- SNOW CHAINS, new pair, 155R13 or similar size, for small cars, \$25. Brammer, 266-5158.
- MINI TV, Sony model 5-307UW, collector's item, first mini TV, 12-110 volt, for sale or trade for mini color TV. Fink, 898-0237.
- TRUMPET and case, used one year, Reynolds, student, \$200. Chinn, 296-5172.
- TWO 8-PLY TRUCK TIRES, 7.50x16, used for 1000 miles, \$40/ea. Martin, 869-2049.
- METAL UTILITY TRAILER, 2-wheel, lights, spare, overload springs, \$500. Johnson, 298-1011.
- TI PORTABLE PROFESSIONAL COMPUTER, 256K, dual floppy, software, TI855 printer, \$1000 OBO. Grafe, 291-9692.
- PUPPY, male schipperke (little black bear), born Dec. 11, champion bloodlines, show quality, parents on premises, \$350. Walker, 281-9587.
- KIMBALL ORGAN, Aquarius, 2 keyboards, bass pedals, auto rhythm and chords possible, bench seat, 3 years old, \$1100. Jellison, 298-9336.
- HOOVER DIMENSION 1000 vacuum cleaner, all attachments, 4-hp motor, \$225 firm. Rodriguez, 294-2212.
- FRIGIDAIRE FREEZER, 16 cu. ft., upright, right-hand door, white, \$180. Sebrell, 821-4227.
- EPSON FX80 PRINTER, \$225; Amdek 300A monitor, \$75; Commodore 1541 disk drive, \$150; Commodore 64, \$100; interfaces and software. Wawersik, 884-7690.
- KOMFORT TRAILER, 1982, 19', fully contained, \$6500. Rigby, 298-1767.
- BRIDAL GOWN, \$75; 2 bridesmaid dresses, size 6, \$20/ea. Stephens, 821-7960.
- TV TEST EQUIPMENT: B&K CRT, tube testers, Sencore color generator, high-voltage probe, TV parts. Sinneros, 883-3925.
- 25" HEATHKIT TV, audio problem, use as is or use parts and cabinet, best offer. Welt, 296-0083.
- TWO BRYANT "LOAD CENTER" breaker boxes, new, 125 amp, 16 poles, \$20/ea. OBO; rabbit hutch, 2 compartments, \$20. Wright, 296-3850.
- DELCO AM CAR RADIO, new, \$25; men's ice skates, size 10, \$15; Peruvian hand-woven wool sweaters, large, \$35. Schubeck, 821-3133.
- BABY GRAND PIANO, 5'6", needs reconditioning, \$1200 OBO. Marder, 883-3863.
- WEIGHT MACHINE, DP Gympac 1500, w/bench and 200 lbs., \$150. Attermeier, 293-2505.
- KITCHEN TABLE, 4 chairs, \$65 OBO; wood and leather easy chair w/

- ottoman, \$60 OBO. Robb, 821-2999.
- KING-SIZE WATERBED, dark pine, bookcase headboard, complete, \$175 OBO. Heifetz, 275-2648.
- DIVAN, makes into a double bed. Kent, 256-1221.
- ORIENTAL-STYLE RUGS: 9' x 12', green/natural; 6' x 9', mostly gold. Lachenmeyer, 268-7475.
- STROLLER, Maxi-taxi, \$25. Ruby, 299-0767.
- OTAGIRI STONEWARE RICE BOWLS, horizon pattern; old cameras. Orear, 256-1941.
- KITCHEN SINK, cast iron, double-size, white, w/fixtures, \$40; Schwinn XR-8 exercise bike, \$175. VanDenAvyle, 898-6474.
- FIREPLACE SCREEN, 24" x 36", \$20; Eureka vacuum cleaner, \$20; 4 sliding glass doors, \$30/ea. Jones, 299-4776.
- BROTHER ELECTRIC TYPEWRITER, w/correction ribbon, \$80; Sunpack electronic flash, professional model, \$65. Montoya, 296-4268.
- PUPPIES: half golden retriever, \$15/ea. Hawn, 281-1419.
- TRAILER HITCH and receiver for Blazer or Jimmy, \$55; white standard rear bumper for Chev. pickup, \$25. Aragon, 881-4795.
- ANTIQUE OAK DRESSER w/beveled mirror; full-size mattress; 9' x 12' light blue Karastan carpet; window air conditioner, Sears. Goetsch, 892-8366.

**TRANSPORTATION**

- '83 TOYOTA CELICA GTS LIFTBACK, 5-spd., AC, sunroof, stereo cassette deck w/equalizer, 25K miles, one owner. Bray, 291-0591.
- '60 FORD 1/2-TON, for parts, \$75; truck and car rims. Padilla, 877-2116.
- 25" MEN'S AZUKI BICYCLE, 10-spd., \$60. Scott, 294-8627.
- '70 MERCURY MONTEREY 2-dr. hardtop, 54K miles, one owner, \$1500. O'Meara, 299-1080.
- '84 NISSAN 300ZX TURBO, below book. Harrison, 266-0813.
- '75 CHEV. LUV PICKUP, \$1600. Miller, 268-5992.
- '81 FORD CONVERSION VAN, 300 cu. in., 61K miles, sliding bay windows, extras inside and out, \$6900. Smith, 823-9521.
- BICYCLE, Takara Mixte 12-spd., 18" frame, \$125. Rosenberg, 296-1346.
- '78 VW Dasher SW, AT, 4-WD, AM/FM cassette w/equalizer, \$1450. Newman, 266-9418.
- '84 NISSAN 300ZX, 24K miles, silver, \$11,500 OBO. Bujewski, 881-1192.
- '78 CHEVETTE, \$750 OBO. Lennox, 821-0474.
- '86 FORD F-150, PS, PB, AC, 6-cyl., 4-spd., LWB, white, 800 miles, \$9200. Padilla, 842-8068.
- '75 MAVERICK, one owner, 6-cyl., 250 cu. in., standard transmission, 2-dr.,

- AC, AM/FM, \$1195. Troncoso, 897-1167.
- '81 MUSTANG GHIA, 43K miles, 6-cyl., AT, AM/FM, PS, PB, cruise, sunroof, \$3200. Surma, 293-2420.
- BICYCLE, girl's, 24", 10-spd. Cropp, 296-1877.
- '72 PORSCHE 914, 1.7 liter, \$2500. Shurter, 897-0404.
- '77 DODGE VAN, new paint, AT, PS, PB, AC, 2 extra bucket seats. Bruce, 936 Gatewood SW.
- '81 OLDS OMEGA BROUGHAM, loaded, 64.5K miles, \$2600. Mauney, 822-0250.
- '78 CHRYSLER LeBARON, AM/FM radio, PS, PB, AC, \$1100. Wagner, 299-6096.
- '73 CHEV. MALIBU, 4-dr., AT, AC, PS, 40K miles, \$1250. Orrell, 299-2300.
- '81 JEEP CJ-7, 49K miles, 6-cyl., 4-spd., PS, \$4300 OBO; '54 Ford Customliner, new interior, exterior, and tires, \$1775 OBO. Schaub, 821-7242 after 5 and weekends.
- '79 CORVETTE L-82, 4-spd., 49K miles, one owner, garaged, T-tops, power windows, \$11,000 OBO. Fleming, 881-2223 or 293-4912.
- '75 FORD MUSTANG, needs body work, \$600. Sanchez, 292-3852.
- '73 JEEP 4-WD PICKUP, 3/4-ton, 4-spd., new engine and clutch, \$2250. Walker, 281-9587.
- '78 FORD F-150 CUSTOM PICKUP, super-cab, 4-spd., AC, PS, PB, clock radio, 68K miles. Hann, 299-7460.
- '76 JEEP WAGONEER, V-8, AT, AC, AM/FM tape, \$1500 OBO. Rayborn, 294-2052.
- BICYCLE, girl's 20" Huffy Desert Rose, \$35. Bivens, 891-8193.
- '68 FORD TORINO FASTBACK, AT, PB, PS, 390 V-8, one owner, 73K miles, \$3250. Hosking, 836-2128.
- '70 VW BUG, rebuilt engine, Michelin radials, \$800. Breiland, 884-8438.
- '78 HONDA CVCC HATCHBACK, 38 mpg on regular gas, rebuilt engine, new radials, brakes, \$1400. Lehrer, 831-4360.
- '85 BUICK RIVIERA, fully loaded, metallic blue, 13K miles, \$14,000 OBO. Archuleta, 345-5108.
- '84 CHEV. S10 PICKUP, V-6, PS, 4-spd., 9K miles, limited edition, matching custom topper, \$5575 OBO. Collins, 266-5868.
- '51 MG-TD, disassembled, \$2000 OBO; '66 Ford Fairlane, \$2400; '77 Cadillac Fleetwood, \$5000. Campbell, 275-0789.
- '83 VW VANAGON GL, water-cooled, sunroof, tint, stereo, hitch, blue on blue, below book. Lachenmeyer, 268-7475.
- '74 CHEV. MONTE CARLO, radials, PS, PB, PW, tilt wheel, Blaupunkt AM/FM cassette stereo, \$1000. Harrison, 292-6856 evenings.
- '79 VW SCIROCCO, 5-spd., Alpine stereo, louver, \$2700 OBO. Garcia, 255-3137.
- '84 NISSAN MAXIMA WAGON, fully

- loaded, cassette, cruise, overdrive, new tires, sunroof, complete maintenance record, \$7895. Burton, 869-2541.
- '53 DODGE POWERWAGON MILITARY 4X4 ambulance, rebuilt engine and drivetrain; 1-1/2 ton military trailer, \$3500/both. Pryor, 294-6980.
- '80 BUICK REGAL LTD, AC, PS, PB, power locks, tilt wheel, AM/FM stereo, new brakes and transmission, \$3200. Salas, 296-5245.
- '76 MERCEDES 450 SL convertible, w/hardtop, 75K miles, \$24,995 OBO. Svensson, 898-3078.
- '74 DODGE DART, 4-dr., 318 engine, original owner, maintenance record, PS, PB, AC. Nelson, 265-2248.

**REAL ESTATE**

- 3-BDR. HOME, Heritage Hills, 1500 sq. ft., 1-3/4 baths, great room, auto sprinklers, backyard pass-through, mountain view, \$89,900. Packwood, 821-6161.
- 4-BDR. HOME, NE, 1-3/4 baths, 1710 sq. ft., sprinklers, new roof and kitchen, \$83,500. Grafe, 291-9692.
- 2 ACRES, east of Albq., gentle southward slope, water and electricity available, \$14,500 or terms for SLFCU member. Rodriguez, 294-2212.
- 3-BDR. HOME, 2-1/2 miles from SNLA, 1-3/4 baths, family room, FP, 1900 sq. ft., single garage, appraised at \$89,000. Paulos, 268-2391.
- 3-BDR. HOME, near Heritage Hills, 1-3/4 baths, LR, DR, FR w/bar, mountain view, \$96,500. Gregory, 821-2125.
- 4-BDR. BRICK HOME, 2-3/4 baths, north of Comanche near Moon, 2200 sq. ft., \$121,900. Philbin, 292-1352.

**WANTED**

- 2 MATCHING GARAGE DOORS, 8' x 7', w/complete hardware. Underhill, 294-5774 after 6.
- SKI RACK for Datsun 280ZX. Gillings, 884-0853.
- BABY STROLLER/CARRIAGE, good condition. Brigham, 293-6914.
- TUNTURI EXERCISE BICYCLE, good condition. Torczynski, 292-7191.
- BEDROOM FURNITURE for young boy: bed, dresser, low table or desk, chair(s), low bookcase, toy box, etc. Field, 268-0025.
- TO BORROW: VHS VIDEOTAPE OF "Maya: Treasures of an Ancient Civilization," shown on Channel 7 on Jan. 20. Schubeck, 821-3133.
- PERSON TO REPAIR older Olympus Rangefinder camera; 60s vintage stereo classical and jazz LPs. VanDenAvyle, 898-6474.



## Samba Special on Tap Tonight

**TASTE TREAT EXTRAORDINAIRE** — Julia Child may not recommend it, but we do. Sprinkle a little Brown Sugar on top of some snow crab or filet mignon, and you have an unbeatable combination. It's all yours tonight at the two-for-one special dinner (featuring the aforementioned crab or filet — two entrees for \$14.95), followed up by a group called Brown Sugar playing Latin music for your dancing pleasure from 8-midnight. To get in on this fun-filled evening, call the Club office for reservations (265-6791) — but hurry.

**CHESHIRE CATS** have nothing on those intrepid T-Bird card players. Their grins stretch from ear to ear because they're in on a not-very-well-kept secret: Everybody has a heck of a good time when the sharks shuffle in to try their luck at the tables a couple of times a month. Join the action on Feb. 5 and Feb. 19, starting at 10:30 a.m. both days.

**HEARTS AND FLOWERS** are headlined, as usual, in February with a Valentine's Day dance — when else? — Feb. 14. This very special occasion begins with a buffet, served from 6-9 p.m., that features baron of beef or mahi mahi with a full salad bar. Afterward, the Don Lesmen group plays those popular Big Band tunes to get you in the mood — a romantic one for sure. Cupid couldn't have put together a better deal; the cost is just \$7.95/person. And manager Sal offers his heartfelt thanks to you for making a reservation ASAP.

**BEAUTY'S IN THE EYE** of the beholder, and she's also on the big screen at Family Night on Saturday, Feb. 7. Start out this super evening at 5 p.m. with a low-cost (dirt cheap, actually) buffet featuring all kinds of kid-pleasin' food: pizza, hot dogs, etc. Then watch the Disney classic, "Sleeping Beauty," at 6 p.m. As always, the movie is free.

### Ins, Outs of VCPs

If you're looking for some ideas on what to do with funds accumulated in your Voluntary Contribution Plan (VCP) account when the VCP is terminated later this year, plan to attend a presentation by Greg Zanetti of E. F. Hutton next Thursday, Feb. 5, from 4:45-5:30 p.m. in Rm. B-5 at the Coronado Club. Topics to be covered are: tax implications of VCP funds, IRA rollovers, and alternative plans acceptable under the Tax Reform Law of 1986. The seminar is free and open to the public.

**SUNDAY'S A DAY OF REST**, and that goes for the cook, too. The cook and everybody else can relax while they enjoy fabulous food at Sunday brunch on Feb. 8 from 10 a.m.-2 p.m. The menu includes all sorts of goodies: a BBQ entree, baron of beef, vegetable, salad bar, fruit juices, and desserts. For the breakfast purists (and not so pure) among you, add scrambled eggs, hash browns, bacon and green chile salsa. Bargain basement prices prevail: \$5.95 for adults, half price for kids under 12. Reservations requested.

**ALONG WITH THE REST** of the Duke City, the Thunderbirds have that wonderful disease, Maya fever. There's a special program on tap for all T-Birds that's pretty good medicine for the ailment. Historian/lecturer/retiree Nick DeLollis presents a slide talk on the Mayan civilization on Monday, Feb. 9, at 1:30 p.m. in the south end of the ballroom. Plan to make a day of it — have lunch, take in Nick's program, and cap it all off by listening in on the T-Bird Board of Directors meeting (right after the Maya program).

**THEY'RE NOT COMPLAINING**, and there's a good reason — all that white stuff on all those slopes. The Coronado Ski Club is off and schussing

in February, with three trips planned: central Colorado, Feb. 8; Monarch, Feb. 13, and Crested Butte, Feb. 22. Club members take time off from the snow for an hour or two on Feb. 17, just long enough to attend the monthly meeting at 7 p.m. in the ballroom; it's rumored that a few lucky people collect some very special door prizes at these get-togethers. Don't say we didn't tell you.

**SAGEBRUSH STOMPERS AND SHUFFLERS**, hold on to your cowboy hats! Have we got news for you. Next Friday night, Feb. 6, the Isleta Poor Boys come ambling into town to belt out their specialty — country/western music — for that bunch of rabid fans at the C-Club. Before the dancing starts, though, you'll want to feast on delicious delights from the buffet. Featured that night are baron of beef, fish, and a full salad bar (\$7.95/person). Brush up your shuffling skills with c/w lessons from 7:30-8:30, when the "real" dancing begins.

The very next week — on Feb. 13 — the Western Flyers take over for your stompin' pleasure. A two-for-one special (\$14.95) that night headlines filet mignon or scallops. When you call for reservations, ask what else is on the menu; those imaginative folks in the C-Club kitchen always add some unadvertised choices on the two-for-ones.

**STAIRWAY TO THE STARS** may not be on the list of places to travel, but a lot of other destinations are yours when you sign up for those trips put together by the C-Club Travel Committee:

**San Antonio** — You'll have the lowdown on this foray into Texas hill country if you attend a travel show on the SA trip next Monday, Feb. 2, at 7 p.m. in the Eldorado room. Spend the Ides of March, St. Patrick's Day, and a couple of other days in San Antonio and surrounding environs. It all happens March 15-18, and includes a trip into the hill country, with stops at Fredericksburg, the LBJ Ranch, and Kerrville. There's a full day of SA sightseeing, and you stay right downtown — so there's plenty of time to explore the Alamo and nearby Riverwalk area. We all know that Texans have a weird sense of humor, right? Wait'll you see what they do to the San Antonio River in honor of St. Pat! The \$421/person price covers three nights' lodging at the Menger Hotel, round-trip air fare, several special meals, and much more.

**D.C. and Virginia** — You'll be submerged in history as you relive some of its great moments on

this trip. Spend time in Williamsburg, Richmond, Charlottesville (where you lunch at the famous Michie Tavern), and other interesting Virginia locales. In D.C., a guided tour takes you to many of the capital's monuments, as well as the Bureau of Engraving, the White House, and Capitol Hill. One complete day is set aside for wandering in the Smithsonian. Topping it all off is the Cherry Blossom Festival Parade, with splendid color and pageantry. This vacation opportunity, April 4-11, is one not to be missed. The \$777/person tab covers RT air fare and charter bus for local transportation; guided tours; seven nights' lodging; admissions (Monticello, tour of mansions and plantations in Richmond, Williamsburg Patriot's Pass, Yorktown Victory Center, Jamestown Festival Park), charter bus, baggage handling, and some meals.

**Laughlin** — The fun never stops (but the sun does set) in Laughlin, southern Nevada's answer to Las Vegas. Try your luck at Laughlin's gaming tables; if it doesn't hold, head out for side trips to Davis Dam and Lake Mohave. It's three solid days of excitement (Feb. 20-22) for the low, low price tag of \$105/person. Included are two nights' lodging at the Riverside Hotel, charter bus fare, snacks and drinks along the way, side tours, taxes and tips, and several meals. Time's growing short, so make that reservation soon.

**Alaska** — This one's a must for even the most seasoned of travelers. Magnificent scenery, Mt. McKinley National Park, city tours of Anchorage and Fairbanks, a stern-wheeler inland cruise, and a one-week cruise on the luxurious *Regent Sea* are all yours if you sign up for the cruise/land option. Or, if you prefer, reserve your space for just the cruise portion. Cruise ports of call include Ketchikan, Juneau, Skagway, and Vancouver, where you'll catch a flight home to Albuquerque. Cost of the complete cruise/land package (Sept. 8-20) is \$2125/person, double occupancy; it's \$1442 for the cruise only (Sept. 13-20). If you don't mind bunking with a few more people, cheaper rates are available for triples and quads. Included are all transportation and transfers, lodging on land and sea, all meals on the cruise, and taxes/tips. But listen up — these prices are guaranteed *only* if you make a \$200 deposit by Jan. 31, and that just happens to be tomorrow. (You can sign up later, but you'll pay more for the same thing. A word to the wise is sufficient, or so they tell us.) Final payment isn't due until July 20. Don't miss this chance of a lifetime!

## feed back

*Q. A few months ago, a new waxing compound was introduced in Bldg. 860. It is gorgeous to look at, but it is so slippery that I have taken a couple of real spills. So far, the only injuries have been minor — just bruises — but this is getting rather old. Most of the men do not seem to be as affected as I am for some reason, perhaps because of the more uniform distribution of the load on men's shoe soles. In my case, it doesn't seem to matter which shoes I have on.*

*Is there anything that can be used in place of this that isn't so slick?*

A. Recently we purchased high-speed buffing machines (burnishers), which are more efficient than the old machines because substantially more floor space can be buffed per time unit. These machines shine the floors with a lustrous wet-look appearance. We did not, however, change the floor wax applied to tile floors. This is a non-slip wax that we have used for several years with good results. While the tile floors now appear more lustrous, they still have the same non-slip quality as before.

As a result of your Feedback, a Safety Engineer used a slip meter to test the tile in Bldg. 860 as

well as in other buildings, including an area that had just been buffed. All readings were in the safe zone.

Jim Martin - 3400

*Q. When I generate a Purchase Order for a product, service, or the like, does Purchasing send a copy back to the requester? I have noticed that lately I do not get my copy from Purchasing with ship dates, actual source the product was bought from, and other data. How can I stay on top of my P.O.s if I do not have this information available?*

A. The purchase order copy identified as the "Requester I" copy is sent to the requester as soon as the purchase order is awarded. This copy will show the scheduled shipping dates, the contractor who received the award, the price(s) paid, the FOB point, and the payment discount.

Requesters should assure that the "Requester I" copy is not removed before sending the purchase requisition set to Purchasing and that the requester's name and organization are clearly visible on this copy so the Mail Room can handle the form efficiently.

Richard Russell - 3700